Monounsaturated fat

In biochemistry and nutrition, a **monounsaturated fat** is a fat that contains a **monounsaturated fatty acid** (**MUFA**), a subclass of fatty acid characterized by having a double bond in the fatty acid chain with all of the remaining carbon atoms being single-bonded. By contrast, polyunsaturated fatty acids (PUFAs) have more than one double bond.

Molecular description

The main constituent of cocoa butter is the monounsaturated fat derived from palmitic acid, oleic acid, and stearic acid.

Monounsaturated fats are triglycerides containing one unsaturated fatty acid. Almost invariably that fatty acid is oleic acid (18:1 n−9). Palmitoleic acid (16:1 n−7) and cis-vaccenic acid (18:1 n−7) occur in small amounts in fats.

Fatty acid component (mole %) of selected fats[1]

fat source	saturated	monounsaturated	doubly unsaturated	tri unsaturated
palm kernel	60–65	10–18	1–3	trace
cottonseed oil	23–30	14–21	45–58	trace
Corn oil	10–15	25–35	40–60	trace
Linseed oil	8–11	18–26	14–20	51–56
Soybean oil	11–17	18–25	49–57	6–11
Peanut oil	12–17	35–42	39–44	trace
Lard	36–48	36–52	10–12	1
Beef tallow	43–64	26–45	2–6	1
Chicken	45–67	12–45	3–10	trace

Health

Studies have shown that substituting dietary monounsaturated fat for saturated fat is associated with increased daily physical activity and resting energy expenditure. More physical activity was associated with a higher-oleic acid diet than one of a palmitic acid diet. From the study, it is shown that more monounsaturated fats lead to less anger and irritability.[2]

Foods containing monounsaturated fats may affect low-density lipoprotein (LDL) cholesterol and high-density lipoprotein (HDL) cholesterol.

Levels of oleic acid along with other monounsaturated fatty acids in red blood cell membranes were positively associated with breast cancer risk. The saturation index (SI) of the same membranes was inversely associated with breast cancer risk. Monounsaturated fats and low SI in erythrocyte membranes are predictors of postmenopausal breast cancer. Both of these variables depend on the activity of the enzyme delta-9 desaturase (Δ9-d).[3]

In children, consumption of monounsaturated oils is associated with healthier serum lipid profiles.[4]

The Mediterranean diet is one heavily influenced by monounsaturated fats. In the late 20th century, people in Mediterranean countries consumed more total fat than Northern European countries, but most of the fat was in the form of monounsaturated fatty acids from olive oil and omega-3 fatty acids from fish, vegetables, and certain meats like lamb, while consumption of saturated fat was minimal in comparison. A 2017 review found evidence that the practice of a Mediterranean diet could lead to a decreased risk of cardiovascular diseases, overall cancer incidence, neurodegenerative diseases, diabetes, and early death.[5] A 2018 review showed that the practice of the Mediterranean diet may improve overall health status, such as the reduced risk of non-communicable diseases. It also may reduce the social and economic costs of diet-related illnesses.[6]

Diabetes

Increasing monounsaturated fat and decreasing saturated fat intake could improve insulin sensitivity, but only when the overall fat intake of the diet was low.[7] However, some monounsaturated fatty acids (in the same way as saturated fats) may promote insulin resistance, whereas polyunsaturated fatty acids may be protective against insulin resistance.[8][9]

Sources

Monounsaturated fats are found in animal flesh such as red meat, whole milk products, nuts, and high fat fruits such as olives and avocados. Algal oil is about 92% monounsaturated fat. Olive oil is about 75% monounsaturated fat.[10] The high oleic variety sunflower oil contains at least 70% monounsaturated fat.[11] Canola oil and cashews are both about 58% monounsaturated fat. Tallow (beef fat) is about 50% monounsaturated fat.[12] and lard is about 40% monounsaturated fat. Other sources include hazelnut, avocado oil, macadamia nut oil, grapeseed oil, groundnut oil (peanut oil), sesame oil, corn oil, popcorn, whole grain wheat, cereal, oatmeal, almond oil, sunflower oil, hemp oil, and tea-oil Camellia.[13]

See also

- High density lipoprotein
- Fatty acid synthesis

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External links

- Fats (Mayo Clinic) (http://www.mayoclinic.com/health/diabetes-diet/DA00075)
- The Chemistry of Unsaturated Fats (http://www.benbest.com/health/essfat.html#chem)